

Art Unit: 1797

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Martin Sulsky on June 12, 2008.

The application has been amended as follows: the title has been changed to

“Microfluidic apparatus, Raman spectroscopy systems, and methods for performing molecular reactions”

Claim 55 has been cancelled.

10. (Currently amended) An apparatus comprising, a first channel comprising a restriction barrier comprising a first angled wall and a second angled wall positioned relative to the first angled wall to form a first opening at least 1 micron in width or diameter and a second opening less than 10 microns in width or diameter, wherein the first opening has a greater width or diameter than the second opening, further comprising a laser light source ~~operable as an optical tweezers~~ and a series of lenses to form a gradient force optical trap operable as optical tweezers configured to capture a particle downstream of the restriction barrier and release it upstream of the restriction barrier, a light source and a Raman detector to detect a single molecule by a surface enhanced Raman spectroscopy, the first channel being in optical communication with the light source and the Raman detector.

13. (Currently amended) A system comprising: a) a light source; b) a Raman detector configured to detect a single molecule by a surface enhanced Raman spectroscopy and c) a first channel in optical communication with the light source and the detector, wherein the first channel comprises a restriction barrier within the first channel, the restriction barrier comprising a plurality of walls to restrain movement of a single particle upstream of light emitted by the light source, wherein the particle has a diameter between 0.1 and 20 microns,

wherein the first channel is separate and distinct from the restriction barrier such that there is a gap between a wall of the channel and the restriction barrier.

46. (Currently amended) An apparatus comprising a first channel having a restriction barrier within the channel, the restriction barrier comprising a first angled wall and a second angled wall positioned relative to the first angled wall to form a first opening large enough to capture a single particle and a second opening small enough to prevent passage of the particle but large enough to allow passage of a biomolecule, wherein the first opening is at least 100 nm wide and the second opening is less than 10 microns wide, and wherein the first opening has a greater width or diameter than the second opening, further comprising a laser light source and a series of lenses to form a gradient force optical trap operable as optical tweezers configured to capture a particle downstream of the restriction barrier and release it upstream of the restriction barrier,

wherein the first channel is separate and distinct from the restriction barrier such that there is a gap between a wall of the channel and the restriction barrier.

2. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The cited art relates to fabrication of microfluidic structures.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Arlen Soderquist whose telephone number is (571)272-1265. The examiner can normally be reached on Monday-Thursday and Alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill Warden can be reached on (571) 272-1267. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Arlen Soderquist/
Primary Examiner, Art Unit 1797